

MISR Level 2 Aerosol/Surface Products Quality Statement April 15, 2002

Quality Designator: Beta

This statement applies to MISR Level 2 Aerosol/Surface Products for April 15, 2002, and beyond until such a time as further improvements to MISR software are made. [Quality statements covering earlier time periods](#) are accessed through links at the bottom of this page.

An extensive review of product quality has not yet been performed. Please read the [summary words of caution](#) if you have not done so already.

In spite of all the warnings, the MISR Level 2 Aerosol/Surface software which generated these products is believed to be functioning quite well except where noted below. This statement highlights major known problems and issues with the products, as well as functionalities which are currently not implemented.

[Aerosol](#) | [Land](#) | [Ocean](#)

AEROSOL (a.k.a. AS_AEROSOL, MIL2ASAE) (from MISR PGE9)

ACP DEPENDENCY

The quality of the aerosol product depends upon the quality of the Ancillary Climatology Product (ACP). The ACP contains information on aerosol particle properties and mixtures of aerosols. Refer to the [ACP quality statement](#) for further information.

TASC DEPENDENCY

The MISR TASC (Terrestrial Atmosphere and Surface Climatology) dataset provides information on the climatological conditions of the area being observed by the MISR instrument. This information is used during the aerosol retrieval process. The TASC dataset is gridded on a month-by-month temporal basis. In the future, this information will be obtained from more timely sources, e.g., the Data Assimilation Office (DAO).

CLOUD DETECTION STATUS

Cloud screening is performed prior to the aerosol retrievals. However, some clouds are currently not being detected. The user is cautioned to be aware of this. Cloud screening is currently performed with algorithms which use the angle-to-angle differences in radiances across MISR cameras, as well as with the MISR-derived Radiometric Camera-by-camera Cloud Mask (RCCM) and Stereoscopically Derived Cloud Mask (SDCM).

OPTICAL DEPTH UNCERTAINTIES

The optical depth uncertainties which are reported over land areas are too high, based upon limited comparisons with ground data. This will be fixed in a future release.

EDGE-OF-SWATH ARTIFACTS OVER OCEAN

The retrieved optical depths over ocean at the edge of the MISR swath occasionally appear brighter than the surrounding values. The cause of this artifact is under investigation.

ALGORITHM UPDATES

The aerosol retrieval algorithms described in the Algorithm Theoretical Basis document have been modified and improved, based on initial analyses of the data. The next release of the MISR Aerosol Retrieval Algorithm Theoretical Basis document will include an updated description of these algorithms.

EXPERIMENTAL AEROSOL ALGORITHM OVER HOMOGENEOUS SURFACES

A new algorithm which retrieves aerosol properties over homogeneous surfaces is included. However, due to the experimental nature of this new algorithm, results from this algorithm are included for diagnostic purposes only. Affected fields in the aerosol product are ChisqHomog, OptDepthHomogCalcPerBand, and ChisqHomogCalcPerBand.

SOME AEROSOL FIELDS NOT AVAILABLE

The following fields in the aerosol product are not currently computed, and contain fill only: RegBestFitMixtureEqRefl; RegSfcRetrOptDepthUnc; OptDepthDWCalcPerBand; OptDepthOTACalcPerBand; ChisqAbsCalcPerBand.



LAND SURFACE (a.k.a. AS_LAND, MIL2ASLS) (from MISR PGE9)

AEROSOL DEPENDENCY

The land surface product relies on the aerosol product for atmospheric correction information. Therefore, the quality of the land product depends upon the quality of the aerosol product. Refer to the [aerosol section](#) for further information.

QUILTING EFFECT IN LAND SURFACE REFLECTANCES

The land surface reflectances are reported on a 1.1 km x 1.1 km grid, while the retrieved aerosol optical depths are computed on a coarser 17.6 km by 17.6 km grid. Values of aerosol optical depth on the coarser grid may "jump" in magnitude from one region to a neighboring region, where the aerosol distribution is not smooth across regions. Therefore, the atmospheric correction using the coarser resolution aerosol data occasionally results in a surface "quilting" effect which can be seen in the land surface reflectances.

RELIABILITY OF LAND SURFACE REFLECTANCE VALUES DEPENDENT UPON AEROSOL OPTICAL DEPTH MAGNITUDE

At the current time land surface retrievals, particularly for low albedo surfaces, should be considered most reliable where aerosol optical depths are low (< 0.2). Thus, it is recommended that users examine the 'RegMeanSpectralOptDepth' field in the Aerosol Product as part of their assessments of the surface parameters. Continuous refinements in the quality of the aerosol retrievals over land are planned for future releases and these are expected to result in improvements in the land product quality at larger optical depths.

FILL VALUES IN LAND SURFACE REFLECTANCES

Land surface reflectances are computed separately for each MISR spectral band. In some cases, the land retrievals succeed in one MISR band, but not another. This can cause visualization problems when viewing a composite image of land surface reflectances which contains spectral bands for both successful and unsuccessful retrievals. As the land surface retrievals improve in the future, this problem should lessen.

LAI/FPAR NOT YET AVAILABLE

The algorithms to compute leaf-area index (LAI) and fraction of photosynthetically active radiation (FPAR) are not yet implemented.

OCEAN (a.k.a. AS_OCEAN, MIL2ASOS) (from MISR PGE9)

OCEAN NOT YET AVAILABLE

The Ocean Surface product, which contains surface reflectance properties over ocean, has not been implemented. It is unavailable at this time.

Also see the:

- [Statement dated September 27, 2001](#) for MISR Level 2 Aerosol/Surface Products from September 27, 2001 to April 14, 2002.
- [Statement dated March 30, 2001](#) for MISR Level 2 Aerosol/Surface Products from March 30, 2001 to September 26, 2001.
- [Statement dated February 16, 2001](#) for MISR Level 2 Aerosol/Surface Products from February 16 to March 29, 2001.

